Impacts of climate change in agricultural markets: A multi-scenario analysis

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Human existence is inherently dependent on agriculture. The anthropogenic induced climate change seems to have an important impact on agriculture; nevertheless, this effect is uncertain. In order to unfold the range of the uncertainty we need to employ scenarios, which represent future greenhouse gases emissions levels as well as their socio-economic drivers. Due to the dynamics of the progress in science, technology and economy there is a need for continuous incorporations of this reality into the scenarios to create them as plausible as possible, in order to obtain essential information about, for instance, policies implications or costs associated to climate change. The scenarios must serve to produce robust results to facilitate policy decision making and not to be just a matter of a scientific exercise.

The fifth Assessment Report (AR5) of Intergovernmental Panel on Climate Change (IPCC) introduced a new set of scenarios, replacing the Special Report on Emissions Scenarios (SRES) scenarios used in the last two reports of IPCC. The assessment of climate change policies in the Impact, Adaptation and Vulnerability (IAV) analysis was one of the main reasons that motivated the development of the new scenarios. This switch is considered as an improvement of the old scenarios, and not a brake in the process of unveiling the uncertainty linked to climate change.

The objective of this work is to establish comparison lines between the old (SRES) and the new scenarios framework (SSPs with RCPs) using the most employed scenarios in economic impacts studies of climate change. In the light of the differences between the scenarios, the analogies can only be approximate. To assess the economic effects of climate change on agriculture a 'structural approach' methodological framework is employed. The projections assessments are based on Global Circulation Models (GCMs) outputs, biophysical and socioeconomic models, with socioeconomic future developments based on old and new scenarios.